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06/30/2006

Shisei Goto

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EXAMINER

CALANDRA, ANTHONY J

ART UNIT

PAPER NUMBER

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,262	Applicant(s) GOTO ET AL.	
	Examiner ANTHONY J. CALANDRA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,8 and 11-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,8 and 11-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/21/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

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Detailed Office Action

The communication dated 2/19/2009 has been entered and fully considered.

Claims 6, 9 and 10 have been cancelled. Claims 25-27 are new. Claims 1-3, 6, 7, 8, 11, 12, 13, 14, 15, and 24 have been amended. Claims 1-5, 6-8, 11-27 are currently pending.

Terminal Disclaimer

The terminal disclaimer filed on 2/19/2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 11/884,012 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

Objections

In light of amendment the objections have been withdrawn.

ODP Rejections

In light of the filing of a terminal disclaimer, the ODP rejections have been withdrawn.

112 Rejections

In light of the applicant's arguments and amendments the 112 2nd rejections have been withdrawn.

Art Rejections

SOLOMONITSYN in view of SOVIET '085

Examiner notes for the record that the full translation of the SOVIET '085 patent has been included in the case file.

Applicant argues that SOLONITSYN differs from the instant claimed invention that the bubbles formed by cavitation are only present in the fibers in contrast to present invention where the bubbles collapse of the fiber surface.

The claim does not directly state that the bubbles contact the ‘surface’ of the fiber however the limitation ‘strip a contaminant *on* pulp fibers’ is taken as the outer surface of the fibers.

Applicant argument is incorrect when the applicant states that the bubbles only form inside the fibers. A complete reading of the reference reveals the following:

“A hydrodynamic cavitation field is established at the place of contraction of the waste water flow to intensify the process of saturating the waste water with fine-disperse air bubbles [column 15 lines 42-45].” Therefore not only are cavitation bubbles formed within the fibers but the bubbles are additionally formed inside the wastewater itself.

Additionally, “examination of the fiber microstructure have proved also that its treatment in the hydrodynamic cavitation field is conducive to an intensive elimination of the unreactive layers of the cell wall and a uniform fibrillation of the fiber surface [column 12 lines 70-75]”. Therefore the cavitation treatment in fact interacts with the surface of the fiber.

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Applicant argues that SOLONITSYN utilizes cavitation forces generated by a cylindrical solid body in the hydrodynamic flow of suspension in contrast the instant invention strips containments with bubbles generated by ‘use’ of a fluid jet.

The fluid jet nozzle (15) is pointed at the cylindrical solid (12) therefore it is ‘used’ [Figure 2]. Applicant needs to claim how the ‘use’ is distinguished from the prior art by actively reciting the steps of ‘use’.

Additionally, SOLONITSYN discloses a cylindrical solid enhances the cavitation and that cavitation is still produced from the jet nozzle [column 6 lines 40-56] the cylindrical solid only enhances the production of cavitation [column 7 lines 18-26].

AAPA

The examiner made the assertion that velocity and pressure are related factors recognized by the prior art in the instant application as the examiner failed to cite the correct portions of the applicant’s specification. Therefore the examiner has additionally withdrawn the rejection based on AAPA. For the record the examiner would have pointed to paragraph [0036] which states that if the velocity is too low the pressure drop will be too low, at velocities that are above 200 m/s the pressure are too high. As the applicant is not claiming the invention of cavitation but the use of cavitation in paper recycling the examiner had interpreted the paragraph as prior art. Further, it is known that pressure drop (differential) is directly related to velocity is one of the ‘first principles’ of fluid dynamics and chemical engineering (Bernoulli’s equation).

SOLOMONITSYN in view of SOVIET '085 and SMOOK

Applicant amended the apparatus claims to include a baffle plate, a pressure control mechanism includes a pressure detection mechanism and/or an outlet flow rate mechanism. Applicant argues that SMOOK only teaches an on-off valve.

In figure 24-2 SMOOK discloses that in control loops a sensor is used which transmits a signal to a controller which actuates the valve. SMOOK discloses that when the variable is pressure a pressure measuring sensor such as a diaphragm is used [Table 24-1]. SMOOK discloses the use on 'control valves' [pg. 358 column 2], which are able to regulate flow of a process fluid through a wide range of actuated valve openings.

Applicant argues that a 'baffle plate' is not taught in any of the applied prior art references.

SOLOMONITSYN teaches a cylindrical member (12) [Figure 2]. As it is in the way of the flow it is a baffle, however it is cylindrical. The term plate is given the claim construction of "A smooth, flat, relatively thin, rigid body of uniform thickness". As (12) is cylindrical it cannot be considered a plate.

SOLOMONITSYN further shows in figure 2, the nozzle shown by opening 15. Forming the nozzle are 2 plates, circled below, located behind the nozzle outlet. This diagram matches up

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favorably to Figure 10 of the instant application where there is a nozzle and a backing baffle plate located behind the nozzle (47).

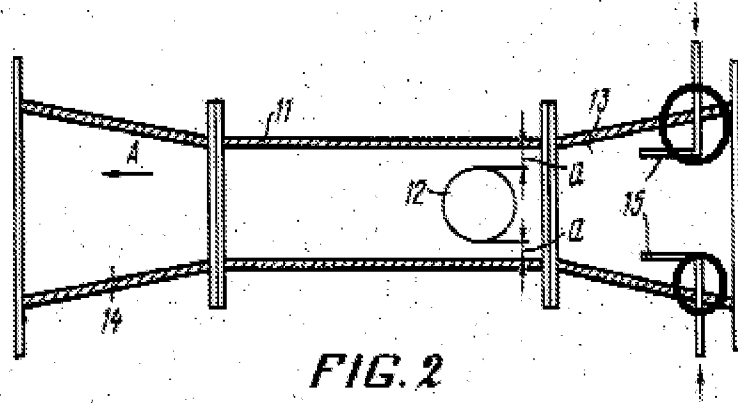
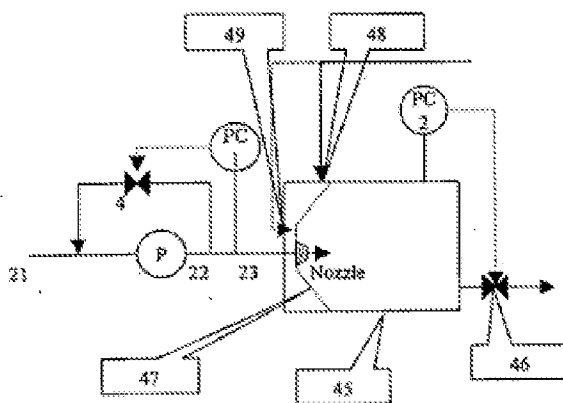


Figure 10



The amended apparatus claims are also rejected in view of EP 1170387 A1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 15-18 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 1170387 A1 SOYAMA, hereinafter SOYAMA.

The examiner notes that this is an apparatus claim and is not tied to the intended use. Apparatus claims are defined by structure.

As for claims 15 and 16, SOYAMA discloses an apparatus with vessel (3), nozzle (4), pressure/flow control valve (6) upstream of the nozzle, steel sample plate (W) {as a baffle plate}, pump (P) upstream of the nozzle, which is controlled by a pressure sensor [Figure 2 and 0049].

As for claim 17, SOYAMA discloses that the vessel has an outlet valve which can control the outlet pressure [Figure 2].

As for claim 18, the vessel is shown to have other openings which can act as inlets [figure 2 (2)].

As for claim 22, SOYAMA discloses two valves which can keep the level constant [Figure 2 (6) and (8)].

Claim Rejections - 35 USC § 103

2. Claims 1-4, 6, 7, 11-14, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent # 3,834,982 SOLONITSYN et al., hereinafter '982 patent, in view of foreign patent document SU 720085 PILIPENKO et al., hereinafter SOVIET '085, as evidenced by Handbook For Pulp and Paper Technologists by SMOOK, hereinafter SMOOK.

Examiner refers to and has included with the office action the English Translation of the SOVIET '085 patent.

As for claim 1-3, 11, 12, 25 and 26 the '982 patent discloses a method for treating pulp using cavitation which delaminates and fiberates fibers using a fluid jet (*method for producing recycled pulp characterized in that bubbles are generated by cavitation and contacted with a pulp suspension to strip a contaminant deposited on pulp fibers and inorganic particles during the process of recycling waste paper* [column 7 lines 18-27, column 8 lines 29-52, and column 9 lines 9-14 Figure 1). Figure 1 shows a pulp slurry exiting holding tank (5) and then being pumped by pump 3 through cavitation nozzle (1) and then into reactor (6). The '982 patents discloses treating the pulp fiber to separates waste water from the fiber [column 7 lines 65-67]. However, it is not clear if this waste water implicitly infers that the pulp is repulped waste pulp.

SOVIET '085 discloses that waste paper can be used in a cavitation reactor for fibrillation which enhances the paper [pg. 2 last paragraph]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use waste paper in the cavitation reactor of the '982 patent. A person of ordinary skill in the art would be motivated to use waste paper in the '892 method as SOVIET '085 states that cavitation reactions enhance the waste paper [pg. 2 last paragraph, and Table 2]. Further, it is *prima facie* obvious to substitute one known component

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for another. In the instant case it would have been obvious to substitute one known pulp type of the '982 patent for the other known pulp type of the SOVIET '085 patent. A person of ordinary skill in the art would reasonably expect that the SOVIET '085 fibers would be delaminated like the fibers of the '982 patent. Examiner notes the cavitation which delaminates the fibers would have the effect of removing contaminants deposited on the fibers.

As for claim 4, SOVIET '085 does not disclose the contaminants of the waste fiber. However, it is the examiners position that ink is a common contaminant of waste fiber as evidenced by SMOOK [pg. 214-215].

As for claim 7, the '892 patent discloses a pressure developed of 30-40 meters H₂O but does not disclose the pressure upstream or downstream of the pump. SOVIET '085 discloses *"75-120 m water pressure at the inlet and 20-30 m water pressure at the outlet"* [claim 1]. The pressure inlet pressure range of 75-120 meters of water column is equivalent to 0.73 MPa – 1.174 MPa which falls within the instant claimed range [(conversion as follows: meters water column * (3.28 ft/meter) * (1 psig/2.31 ft) * (0.006894 MPa /psig)].

As for claims 13 and 27, the '892 patent discloses a pressure developed of 30-40 meters H₂O but does not disclose the pressure upstream or downstream of the pump. SOVIET '085 discloses *"75-120 m water pressure at the inlet and 20-30 m water pressure at the outlet"* [claim 1]. This is equal to an instant claimed pressure ratio of 0.16 to 0.4 which fall within the instant claimed range. The pressure outlet pressure range of 20-30 meters of water column is equivalent to 0.196- 0.29 MPa which falls within the instant claimed range [(conversion as follows: meters water column * (3.28 ft/meter) * (1 psig/2.31 ft) * (0.006894 MPa /psig)]. The pressure inlet pressure range of 75-120 meters of water column is equivalent to 0.73 MPa – 1.174 MPa which

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falls within the instant claimed range [(conversion as follows: meters water column * (3.28 ft/meter) * (1 psig/2.31 ft) * (0.006894 MPa /psig)]. At the time of the invention it would have been obvious to apply the pressures given by SOVIET '085 to the '892 patent. The person of ordinary skill in the art would be motivated to apply known cavitation techniques taught by SOVIET '085 to obtain enhanced fiber properties [table 2].

As for claim 14, the '982 patent discloses a pulp consistency of 8% which falls within the instant claimed range [column 10 lines 35-38].

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent # 3,834,982 SOLONITSYN et al., hereinafter '892 patent, in view of foreign patent document SU 720085 PILIPENKO et al., hereinafter SOVIET '085, as applied to claims 1 and 2 above, and further in view of U.S. Patent 7,264,182 RICHTER et al., hereinafter RICHTER.

Neither, the '892 patent nor SOVIET '085, disclose the velocity of the fluid jetting from the nozzle/orifice. RICHTER discloses cavitating nozzles [abstract], for treating organic suspensions. RICHTER discloses that the speed and pressure affect the degree of breakup [column 4 lines 45-65]. RICHTER further states that the ideal speed is 14 m/s which falls within the instant claimed range. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the cavitation nozzle speed of 14 m/s as disclosed by RICHTER. A person of ordinary skill in the art would be motivated to use this speed as it is the ideal speed.

4. Claims 5, 15-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent # 3,834,982 SOLONITSYN et al., hereinafter '892 patent, in view of foreign patent

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document SU 720085 PILIPENKO et al., hereinafter SOVIET '085, and by Handbook For Pulp and Paper Technologists by SMOOK, hereinafter SMOOK.

As for claim 5, '982 patent discloses a method for treating pulp using cavitation which delaminates and fiberates fibers using a fluid jet (*method for producing recycled pulp characterized in that bubbles are generated by cavitation and contacted with a pulp suspension to strip a contaminant deposited on pulp fibers and inorganic particles during the process of recycling waste paper* [column 7 lines 18-27, column 8 lines 29-52, and column 9 lines 9-14 Figure 1). Figure 1 shows a pulp slurry exiting holding tank (5) and then being pumped by pump 3 through cavitation nozzle (1) and then into reactor (6). The '982 patents discloses treating the pulp fiber to separates waste water from the fiber [column 7 lines 65-67]. However, it is not clear if this waste water implicitly infers that the pulp is repulped waste pulp.

SOVIET '085 discloses that waste paper can be used in a cavitation reactor for fibrillation which enhances the paper. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use waste paper in the cavitation reactor of the '982 patent. A person of ordinary skill in the art would be motivated to use waste paper in the '892 method as SOVIET '085 states that cavitation reactions enhance the waste paper [table 2]. Further, it is prima facie obvious to substitute one known component for another. In the instant case it would have been obvious to substitute one known pulp type of the '982 patent for the other known pulp type of the SOVIET '085 patent. A person of ordinary skill in the art would reasonably expect that the SOVIET '085 fibers would be delaminated like the fibers of the '982 patent. Examiner notes the cavitation which delaminates the fibers would have the effect of removing contaminants deposited on the fibers.

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The '982 patent discloses that by adding air into the process the reactor can act as a flotation device which entrains contaminants by flotation from wastewater containing fibers [column 15 lines 40-57]. Therefore the '982 patent discloses flotation after the cavitation nozzle. The '982 patent does not disclose any steps subsequent to flotation. SMOOK discloses there are multiple flotation steps and cleaning steps that are used in paper deinking [pg. 216-217]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to have a second flotation step subsequent to the cavitation floatation step. A person of ordinary skill in the art would be motivated to do so to obtain brighter and more deinked pulp.

As for claim 15, 17 and 22 the '982 patent discloses pulp processing equipment with a nozzle for emitting a pressurized jet of liquid (1) which then enters into processing unit (6) [Figure 1]. The patent discloses a pump (3) upstream of the nozzle (1) [Figure 1]. SOLONITSYN shows in figure 2, the nozzle shown by opening 15. Forming the nozzle are 2 plates, circled below, located behind the nozzle outlet. This diagram matches up favorably to Figure 10 of the instant application where there is a nozzle and a backing baffle plate located behind the nozzle (47).

The '982 patent discloses that the pressure values can be altered to effect the cavitation. One method given by the '982 patent is adjusting the height of pipe '8'. Adjusting the height of a pipe effectively changes the static pressure [column 10 lines 60-67]. SOVIET '085 patent discloses that for wastepaper treatment a upstream pressure of 75-120 m water pressure at the inlet and a downstream pressure of 20-30 m water pressure at the outlet of the cavitation unit. SOVIET '085 does not disclose how the pressure is controlled. The method of adjusting pressure in the '982 is a fixed method (i.e. once set it cannot be changed without reorganizing

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equipment). SMOOK discloses that control valves, controlled by a DCS, can be used to adjust pressure [pg. 356 Figure 24-2, pg. 357-359]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the apparatus of '982 patent with the control valve of SMOOK upstream of the cavitation nozzle and downstream of the vessel. A person of ordinary skill in the art would do so to control both the pressure upstream and downstream of the cavitation nozzle automatically. The upstream and downstream pressures effect cavitation. A person of ordinary skill in the art would be motivated by SMOOK who states that controls allow for efficient operation of processes [pg. 356] and to control the process within well defined limits of variation [pg. 355]. SMOOK also states that today very few elements are under manual control [pg. 355]. Automating a manual activity is generally *prima facie* obvious [see e.g. MPEP 2144.04 (III) Automating a manual activity].

The '982 patent discloses after vessel (6) that the flow is split between lines (7) and (9) [Figure 1]. The '982 patent does not explicitly disclose how the flow is controlled. SMOOK discloses that control valves, controlled by a DCS, can be used to adjust pressure [pg. 356 Figure 24-2, pg. 357-359]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the apparatus of '982 patent with a flow control valve of SMOOK. A person of ordinary skill in the art would do so to control both the flow rates to control the production rate of the device. A person of ordinary skill in the art would be motivated by SMOOK who states that controls allow for efficient operation of processes [pg. 356] and to control the process within well defined limits of variation [pg. 355]. SMOOK also states that today very few elements are under manual control [pg. 355]. Automating a manual

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activity is generally *prima facie* obvious [see e.g. MPEP 2144.04 (III) Automating a manual activity].

As for claim 16, the '982 patent vessel is a continuous treatment vessel [column 15 line 75].

As for claims 18 and 19, the '982 patent shows a general reactor (6) in Figure 1. The reactor has additional connections for 7 and 9 which are outlets (although could be used as an inlet for washing). Also additional inlets for cleanout ports are well known in the art. The reactor is shown to have a conical bottom. The '982 patent says that the treatment vessel can be a floatation device [column 15 lines 35-55]. SMOOK discloses a centrifugal cleaner which has a conical shape [pg. 115 Figure 9-32]. At the time of the invention it would have been obvious to substitute the flotation device of the '982 patent for the centrifugal cleaner of SMOOK. Both devices are used to clean pulp, more specifically both devices are used to clean recycled pulp [pg. 219 Figure 14-18]. The centrifugal cleaner of SMOOK has an elutriation liquid inlet [Figure 9-32].

As for claim 20, the examiner has interpreted the flotation cell (6) of the '982 patent as the separating means [Figure 1]. It has line 17 which returns liquid from the vessel to tank (5). From tank (5) some of the liquid overflows and is returned to the vessel by way of pump (4).

As for claim 21, the outlet line 7 goes into the tank (5). In the tank the liquid can either go out fork (20) or over the baffle wherein it is then circulated through the pump to the inlet nozzle.

As for claim 23, the processing equipment/separating means of the '982 patent vessel is a flotation unit [column 15 lines 40-57]

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As for claim 24, the processing equipment of the '982 patent vessel is a flotation unit [column 15 lines 40-57].

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJC/

/Eric Hug/
Primary Examiner, Art Unit 1791